

LISTING OF CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in this application.

1. (currently amended) A flexible connection unit for use in a spinal fixation device, comprising

a ~~first bone coupling assembly;~~

a ~~second bone coupling assembly; and~~

a longitudinal rod, including:

a ~~first end received by and coupled to a first bone coupling assembly;~~

a second end; and

a longitudinal substantially cylindrical center section having a longitudinal axis and an outer surface, the center section being located between and coupled to the first end and the second end, the center section including a plurality of grooves formed in the outer surface of the substantially cylindrical center section, the plurality of grooves extending diametrically around the longitudinal axis and a plurality of holes formed in the substantially cylindrical center section, each hole intersecting one of the grooves formed in the outer surface of the rod, ~~along at least a portion of the surface of the center section, at least two of the plurality of grooves directly coupled on the center section surface by an hole, and the hole at least twice as wide as the coupled grooves average width,~~

~~wherein the second bone coupling assembly is connected to the rod at a different location than the first bone coupling assembly.~~

2. (previously presented) The flexible connection unit of claim 1, wherein the rod is made from a material selected from the group consisting of: stainless steel, iron steel, titanium, titanium alloy and NITINOL.

3. (canceled)

4. (previously presented) The flexible connection unit of claim 1, wherein the grooves are cut toward a center longitudinal axis of the rod.

5. (currently amended) The flexible connection unit of claim 1[4], wherein the rod is solid along a longitudinal section.

6. (previously presented) The flexible connection unit of claim 5, further including a plurality of transverse tunnels formed within at least a portion of the solid longitudinal section and wherein each tunnel coincided with at least one hole.

7. (currently amended) The flexible connection unit of claim 6, wherein the rod is solid and the first end, the second end, and the center section are monolith and ~~the rod is cylindrical in shape and~~ each transverse tunnel passes through a center longitudinal axis of the cylindrical portion of the rod such that openings for each respective transverse tunnel are located on opposite sides of the ~~cylindrical wall of the rod~~ and coincides with at least one hole.

8. (previously presented) The flexible connection unit of claim 1, wherein the first end, the second end, and the center section are a monolith.

9. (canceled)

10. (previously presented) The flexible connection unit of claim 6, wherein each of said plurality of transverse tunnels have an internal diameter between 0.2 and 3 millimeters.

11.-14. (canceled)

15. (currently amended) A connection unit for use in bony fixation, comprising:

a first bone coupling assembly; and

a longitudinal solid metal rod having an outer surface, including:

a first end received by and coupled to the ~~a~~ first bone coupling assembly;

a second end; and

a substantially cylindrical center section located between and coupled to the first end and the second end, the center section including a plurality of grooves formed in the outer surface of the rod ~~along at least a portion of the surface of the center section, and a plurality of tunnels formed in the center section of the rod, each tunnel including a pair of diametrically opposed openings on the outer surface of the rod, wherein the tunnel openings intersect one of the grooves formed in the outer surface of the rod at least two of the plurality of grooves directly coupled on the center section surface by an hole, and the hole at least twice as wide as the coupled grooves average width.~~

16. (previously presented) The connection unit of claim 15, wherein the rod is made from a material selected from the group consisting of: stainless steel, iron steel, titanium, titanium alloy and NITINOL.

17. (canceled)

18. (previously presented) The connection unit of claim 15, wherein the grooves are cut toward a center longitudinal axis of the rod.

19. (canceled)

20. (canceled)

21. (canceled)

22. (previously presented) The connection unit of claim 15, wherein the first end, the second end, and the center section are a monolith.

23. (previously presented) The connection unit of claim 21, wherein each of said plurality of transverse tunnels have an internal diameter between 0.2 and 3 millimeters.

24. (currently amended) A connection unit for use in bony fixation, comprising:

a longitudinal solid metal rod having an outer surface, including:

a first end;

a second end; and

a substantially cylindrical center section located between and coupled to the first end and the second end, the center section including a plurality of grooves formed in the outer surface of the rod ~~along at least a portion of the surface of the center section~~, and a plurality of tunnels formed in the center section of the rod, each tunnel including a pair of diametrically opposed openings on the outer surface of the rod, wherein the tunnel openings intersect one of the grooves formed in the outer surface of the rod

~~at least two of the plurality of grooves directly coupled on the center section surface by an hole, and the hole at least twice as wide as the coupled grooves average width;~~

~~a first bone coupling assembly connected to the rod, the first bone coupling assembly capable of securing the rod to a bone structure of a patient; and~~

~~a second bone coupling assembly connected to the rod at a different location than the first bone coupling assembly, the second bone coupling assembly capable of securing the rod to a bone structure of the patient at a different location from the first coupling assembly.~~

25. (previously presented) The connection unit of claim 24, wherein the rod is made from a material selected from the group consisting of: stainless steel, iron steel, titanium, titanium alloy and NITINOL.

26. (canceled)

27. (previously presented) The connection unit of claim 24, wherein the grooves are cut toward a center longitudinal axis of the rod.

28. (canceled)

29. (canceled)

30. (canceled)

31. (previously presented) The connection unit of claim 24, wherein the first end, the second end, and the center section are a monolith.

32. (previously presented) The connection unit of claim 30, wherein each of said plurality of transverse tunnels have an internal diameter between 0.2 and 3 millimeters.

33. (new) The connection unit of claim 24, wherein the tunnels pass through a center longitudinal axis of the cylindrical portion of the rod.

34. (new) The connection unit of claim 24, wherein adjacent tunnels share a common opening on one side of the outer surface of the rod thus forming a zig-zag pattern of tunnels passing transversely through a central longitudinal axis of the rod.

35. (new) The connection unit of claim 24, wherein the tunnel has a diameter and the grooves have a width, the diameter of the tunnel is at least twice as wide as the width of the grooves.

36. (new) The connection unit of claim 24, wherein each tunnel has a longitudinal axis, the longitudinal axis of each tunnel being substantially parallel to the longitudinal axis of an adjacent tunnel so that the tunnels are substantially parallel with respect to one another.

37. (new) The connection unit of claim 24, wherein each tunnel has a longitudinal axis, each tunnel is substantially orthogonal to an adjacent tunnel.

38. (new) The connection unit of claim 37, wherein each tunnel intersects at least one adjacent tunnel.